

Amendments to the Specification

Please amend the heading beginning on page 1, before paragraph [0001], as follows:

TECHNICAL FIELDBACKGROUND OF THE INVENTION1. Technical Field

Please amend the sub-heading beginning on page 1, before paragraph [0002], as follows:

BACKGROUND ART2. Description of the Related Art

Please amend the paragraph [0003] beginning on page 1, as follows:

[0003] As an example of sterilization with hydrogen peroxide plus plasma, JP Laid-open Application No. S61-293465 patent document 1 below describes a sterilization method which includes a step of placing an object to be sterilized in a chamber, a step of keeping the object in contact with hydrogen peroxide for a time sufficient for the hydrogen peroxide to become closely involved with the object, a step of generating plasma around the object, and a step of holding the object in the plasma for a time required for sterilization.

JP Laid-open Application No. H1-293871 Patent document 2 below describes a sterilization method that includes a step of bringing an object to be sterilized into contact with hydrogen peroxide, a step of placing the object including residual hydrogen peroxide in a decompression chamber, a step of generating plasma around the object in the decompression chamber, and a step of holding the object in the plasma for a time sufficient to achieve sterilization by means of active species of the residual hydrogen peroxide.

JP Patent Publication 2003-533248 Patent document 3 below describes a plasma disinfection system wherein before plasma disinfection liquid hydrogen peroxide is first vaporized, and the hydrogen peroxide in a gaseous state is adjusted to the desired pressure and injected using a flow regulator.

JP Laid-open Application No. 2003-310720 Patent document 4 below describes a plasma sterilization apparatus provided with a sterilization chamber and a plasma generation

chamber which communicates with the sterilization chamber so that plasma generated in the plasma generation chamber is supplied together with a sterilization agent to the sterilization chamber.

Please amend the paragraph [0004] beginning on page 2, as follows:

[0004] As an example of sterilization with ozone plus plasma, JP Laid-open Application No. 2003-159570 patent document 5 below describes a sterilization and dry washing apparatus wherein oxygen or a mixed gas containing oxygen is subjected to discharge excitation within a treatment chamber housing an object to be treated to generate plasma, gaseous water molecules are sprayed, and the gas is exposed to ultraviolet rays.

JP Laid-open Application No. 2003-250868 Patent document 6 below describes a plasma sterilization processor wherein oxygen or a gas containing oxygen within a gas supply pipe is converted to plasma and supplied to a sterilization chamber, a gas supplied within the sterilization chamber is also converted to plasma, and these plasmas are contained by a magnet arranged within the sterilization chamber.

Please amend the paragraph [0005] beginning on page 3, as follows:

[0005] As an example of sterilization with hydrogen peroxide plus ozone, JP Laid-open Application No. 2002-360672 patent document 7 below describes a sterilizer wherein hydrogen peroxide is first supplied to a treatment container which houses an object to be sterilized, and ozone is then added to the treatment container.

Please delete the paragraph [0007] beginning on page 3, as follows:

[0007] Patent document 1:

JP Patent Application Laid-open No. S61-293465

(Patent No. 1636983)

Patent document 2:

JP Patent Application Laid-open No. H1-293871

Patent document 3:

JP Patent Publication 2003-533248

Patent document 4:

JP Patent Application Laid open No. 2003-310720

Patent document 5:

JP Patent Application Laid open No. 2003-159570

Patent document 6:

JP Patent Application Laid open No. 2003-250868

Patent document 7:

JP Patent Application Laid open No. 2002-360672

Please amend the heading beginning on page 4, before paragraph [0008], as follows:

DISCLOSURE OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

SUMMARY OF THE INVENTION

Please amend the sub-heading beginning on page 4, before paragraph [0009], as follows:

MEANS TO SOLVE THE PROBLEMS

Please amend the paragraph [0009] beginning on page 4, as follows:

[0009] To ~~reslove~~ solve the aforementioned problems, the sterilization method of the present invention comprises:

a decompression step of decompressing a chamber which houses an object to be sterilized;

a hydrogen peroxide supply step of supplying hydrogen peroxide into the aforementioned chamber;

an ozone supply step of supplying ozone into the aforementioned chamber;

a sterilization step of sterilizing the object to be sterilized by diffusing the hydrogen peroxide and ozone supplied within the aforementioned chamber;

an exhaust step of exhausting the gas from within the aforementioned chamber; and a plasma generation step of generating plasma within the aforementioned chamber.

Please amend the paragraph [0015] beginning on page 7, as follows:

[0015] The aforementioned hydrogen peroxide supply unit is unit preferably comprises an antiscattering member to prevent the hydrogen peroxide supplied in liquid form to the inside of the aforementioned chamber from scattering. In this way, scattering due to rapid evaporation is prevented when the hydrogen peroxide is supplied in a liquid state within the decompressed chamber.

Please amend the paragraph [0017] beginning on page 7, as follows:

[0017] It is desirable to further include a sterilization gas circulation unit that circulates the sterilization gas in the aforementioned chamber. It is thus possible to uniformly disperse the sterilization gas in the chamber, thereby enhancing the sterilization effects.

Please amend the sub-heading beginning on page 8, before paragraph [0019], as follows:

~~EFFECT OF THE INVENTION~~

Please amend the paragraph [0019] beginning on page 8, as follows:

[0019] Greater sterilization effects are produced by the sterilization method and apparatus of the present invention through the combined use of hydrogen peroxide, ozone and plasma. Moreover, not only is the residual hydrogen peroxide near the object to be sterilized broken down, but sterilization of the object to be sterilized is further promoted by the various radicals generated during decomposition, thereby greatly shortening the sterilization time.

Please amend the paragraph [0020] beginning on page 8, as follows:

[0020] Fig. 1 is a schematic block diagram of a sterilization apparatus according to the ~~first-a~~ first embodiment of the present invention;

Fig. 2 is a front view showing a sterilization apparatus of the present invention with the door open;

Fig. 3 is a side cross-section of the sterilization apparatus of Fig. 2;

Fig. 4(a) is a bottom view of a high-voltage electrode;

Fig. 4(b) is a perspective view of the perforated part of an insulating body;

Fig. 5 is a block diagram of a hydrogen peroxide supply unit;

Fig. 6 is a block diagram of an ozone supply unit;

Fig. 7 is a block diagram of an exhaust unit;

Fig. 8 shows pressure changes within a chamber;

Fig. 9 shows sterilization speeds under various conditions;

Fig. 10 is a schematic block diagram of a sterilization apparatus according to the ~~second-a~~ second embodiment of the present invention;

Fig. 11 is a block diagram of a hydrogen peroxide supply unit;

Fig. 12(a) is a block diagram of an ozone supply unit;

Fig. 12(b) is a diagram of an ozone concentration meter;

Fig. 13 is a block diagram of an exhaust unit;

Fig. 14 is a block diagram of a sterilization gas circulation unit;

Fig. 15 is a flow chart showing the operations of a sterilization apparatus;

Fig. 16 shows pressure changes within a chamber;

Fig. 17 is a flow chart of a hydrogen peroxide supply step;

Fig. 18 is a time chart of a hydrogen peroxide supply step;

Fig. 19 is a flow chart of an ozone supply step;

Fig. 20 is a time chart of an ozone supply step;

Fig. 21 is a time chart of a vacuum exhaust step;

Fig. 22 is a flow chart showing the operations of a sterilization apparatus according to a modification of Fig. 15;

Fig. 23(a) shows another embodiment of a hydrogen peroxide supply unit;

Fig. 23(b) shows yet another embodiment of a hydrogen peroxide supply unit;

Fig. 24 shows a structure for sterilizing a tube-shaped object to be sterilized;

Fig. 25 is a partial enlarged view of Fig. 24;

Fig. 26 shows other examples of electrodes.

Please amend the sub-heading beginning on page 10, before paragraph [0021], as follows:

~~EXPLANATION OF REFERENCED NUMERALS~~ Explanation of Reference Numerals

Please amend the heading beginning on page 11, before paragraph [0022], as follows:

~~BEST MODE FOR CARRYING OUT THE INVENTION~~

DETAILED DESCRIPTION OF THE INVENTION